PERMIT CHECK LIST

The following people have reviewed the permit:

Reviewing Permit Writer: _____

Air Compliance Manager: _____

Date: September 7, 2016

Source Name: NASA Langley Research Center (LaRC) Registration No.: 60051

Source Location: 1 Langley Boulevard, Mail Stop 136, Hampton, Virginia

Mail Address: 1 Langley Boulevard, Hampton, Virginia 23681

Source Status: ____ Greenfield ✓ Currently operating

Source Classification: ___ Minor ✓ SynMinor ___ State Major ___ PSD Major ___ TV Major

Permit Action: The facility is adding three 1750 KW diesel generators with 2923 BHP engines at the new Computational Research Facility center at NASA Langley.

✓ **Inspector Contacted/Consulted**

Permit Action Program:

___ NSR ✓ SOP ___ TV ___ Maj HAP ____ General

Permit Action Type:

✓ Significant Amendment

✓ (Y/N) Permit Includes All Emission Units at Source.

✓ (Y/N) Permit Allows Source to avoid Title V/MACT/etc.

Source Classification

After this permit, source is (select one): ✓ Synthetic minor (SM) for NOx, CO, SO2, VOC Pollutants

Permit Application Review

Application ✓ Letter ___ (*select one*) Received Date: April 11, 2016

Application Complete Date: August 16, 2016

Permit Fee Paid Date: July 5, 2016

Permit Deadline Date: February 16, 2017

✓ Document Certification Form received

n/a Confidential information with sanitized copy

N (Y/N) Local Governing Body Certification Form

n/a Copy of letter sent to FLM if applicable. (Comments)

n/a Notification of Affected State(s)

This permit supersedes permit dated: May 17, 2013.

Regulatory Review for this Action

BACT Determination (check one):

✓ Tier 2 certified generators meets BACT for NOx, or

___ TV/SOP/BACT not applicable. (Explain)_____

Y (Y/N) NSPS/MACT/NESHAPS Applicability: If Y, Subpart(s):

Dc, VVV, IIII, JJJJ NSPS ZZZZ(4Z), CCCCCC(6C), JJJJJJ(6J) MACTs _____ NESHAPS

N (Y/N) Existing Rules (9 VAC 5 Chapter 40) Applicability: If Y, Rule(s):

Toxic Pollutants (*check one*):

___ Exempt, or ___ in compliance with 9 VAC 5-60-220, or ✓ not evaluated

Modeling

✓ No modeling required by agency policy (< modeling significance levels, etc.)

Site Suitability:

✓ Site suitable from an air pollution standpoint, inspection date: 2/10/14.

Y Calculation sheet(s) attached

N (Y/N) NSR Netting:

N (Y/N) (CAM) Compliance Assurance Monitoring Applicable (*Title V sources only*)

Permit includes: ___ Stack Testing ___ CEM ___ VEE by source ___ VEO by source

Public Participation

Y (Y/N) Public Noticed. If yes, Public Notice Date: **Tuesday, September 13, 2016**

? (Y/N) Public Notice Comments. If yes, number and nature of comments:

N (Y/N) Public Hearing. If yes, Public Hearing Date:

EPA Review

Y (Y/N) EPA Review. If yes, Date proposed permit sent to EPA: **Friday, September 9, 2016**

N (Y/N) EPA Comments. If yes, give a brief summary_____.

Permitting Analysis:

I. Introduction

NASA Langley Research Center (LaRC) is the oldest of NASA's field centers. Established in 1917 by the National Advisory Committee for Aeronautics, the Center currently devotes two-thirds of its programs to aeronautics, and the rest to space. LaRC researchers use more than 40 wind tunnels to study improved aircraft and spacecraft safety, performance, and efficiency. The facility is located in Hampton between Poquoson and Langley Field. (from their website)

The facility is currently operating under a State Operating permit that limits the facility emissions to below major source thresholds.

II. Project Description And Affected Emission Unit(s)

The facility is planning to install three emergency generators, each rated at 1750 kW with engines rated at 2923 brake horse power. The generators will be certified to EPA Tier 2 emission levels.

III. Regulatory Review

A. 9 VAC 5 Chapter 80, Part II, Article 6 – Minor New Source Review

The facility plans to install three diesel fired emergency generators with engines rated at 2923 brake horse power. For emergency generators being evaluated for Article 6 applicability, 500 hours is used to determine permit applicability instead of 8760 hours of operation. In 9VAC5-80-1105B, “diesel engines with an aggregate rated brake (output) horsepower of less than 1,675 hp” are exempted. The aggregate of these diesel engines is 8769 brake horse power, so they are not exempted by this section of the regulation.

The facility provided the Tier 2 certification and specific engine data to show that this engine class meets the Tier 2 standards of emissions. The table below shows the uncontrolled emissions of each regulated pollutant in comparison to the Article 6 Exemption levels.

Pollutant	Aggregate Uncontrolled Emissions (ton/year)	Article 6 Exemption Level 9 VAC 5-80-1105 D
PM	0.5	15
PM-10	0.5	10
PM-2.5	0.5	6
NOx	15.5	10
CO	1.7	100
VOC	1.6	10
SO2	0.02	10

NOx exceeds the exemption levels, so the installation of the three generators does meet the definition of a project.

The engines will be applicable to NSPS IIII and MACT ZZZZ, so no toxics evaluation is necessary.

B. 9 VAC 5 Chapter 80, Article 5 – State Operating Permit

The facility has an SOP to remain a synthetic minor source. The generators will be added to the SOP and throughputs for the facility will change.

While the permit was open a complete review of all the throughputs of all fuels and the various emission units at the plant was done. Prior to this action the facility had a facility wide NOx limit of 97.8 tons. In order to add these units, the throughputs of all fuels needed to be adjusted so the new units could have a specific throughput assigned to them.

In the past, the natural gas being fired by the natural gas fired generators has been lumped in with the throughput for the boilers. This action also separates out the natural gas fired by the generators and limits them to a certain amount of fuel.

It was also discovered that the miscellaneous emission sources have not been reporting emissions and some of the units have been removed. To allow the maximum flexibility for the source several new miscellaneous activities have been added to the permit with a limited number of hours of operation.

C. 9 VAC 5 Chapter 80, Part II, Article 8 - PSD Major New Source Review and Article 9 – Nonattainment Area Major New Source Review

This facility is not a PSD sized source and the increase in emissions is less than the significance levels in Article 8, so no Article 8 review was done.

C. 9 VAC 5 Chapter 50, Part II, Article 5 - NSPS

The generators being added will be subject to NSPS IIII, which had not been delegated to Virginia at this time. The facility is also applicable to NSPS Dc, VVV and JJJJ.

D. 9 VAC 5 Chapter 60, Part II, Article 1 - NESHAPS

There are no NESHAPS applicable to this action or the facility.

E. 9 VAC 5 Chapter 60, Part II, Article 2 - MACT

The generators being added are applicable to MACT ZZZZ, which has not been delegated to Virginia at this time. The facility is also applicable to 6C and 6J. Both of these regulations are also non-delegated regulations.

IV. Best Available Control Technology Review (BACT) (9 VAC 5-50-260)

BACT applicability is determined on a pollutant-by-pollutant basis in the same way permit applicability is determined. NOx is the only pollutant that exceeded the applicability for Article 6, so it is the only pollutant that will be required to apply BACT. BACT for new, large, emergency generators is to meet the certification requirements for Tier 2 engines. These engines/generators are certified to meet the Tier 2 standards so they meet BACT.

V. Summary of Actual Emissions Increase

The older (non-NSPS) generators will be permitted to use 36,000 gallons of diesel per year, with a total gallon limit of 50,000 gallons per year. This allows the new units to use 14,000 gallons per year. This limit may result in an increase in emissions from the generators of the following:

Pollutant	Actual Emissions from generators using all fuel allowed (ton/year)
PM	0.03
PM-10	0.03
PM-2.5	0.03
NOx	1.02
CO	0.11
VOC	0.11
SO2	0.00

The facility wide totals are changing (and decreasing) as a result of the new throughput limits the facility has proposed for the different emissions units which are shown in the table below:

Pollutant	Previous Facility-Wide Limits (ton/year)	New Facility-Wide Limits (ton/year)
PM	39.0	13.7
PM-10	28.7	12.0
PM-2.5	-	9.6
NOx	97.8	95.3
CO	59.8	61.1
VOC	32.7	23.4
SO2	42.4	10.0
Single HAP	5.4	5.4
Combined HAP	5.4	16.5

VII. Boilerplate Deviations

There are no deviations in the boilerplate.

VIII. Compliance Demonstration

To demonstrate compliance, the facility will have to keep detailed records as specified in Condition 43. These records include: tracking throughputs of all the fuels used in the boilers; creating a new list of all conventional combustion units each year; the military specification sheets for the rocket fuels; fuel certifications; throughputs of fuel to the burners in the research building 1236; how much heated air is used for the SCRAM jet; number of runs for the CHSTF and the DCSCTF; the number of seconds the HTT ran; the operating hours for HyMETS, the tape pre-pregging machine, the MWWA, the MMCA, and the MABA; annual list of paint booths onsite, throughputs of paint; MSDS sheets for the paints; the throughput of diesel and natural gas used by the generators and fire pumps; an annual updated list of all the generators and fire pumps on site; the throughput of solvents of the parts washers; and annual list of all the cold cleaners on site including MSDS sheets; investment casting wax and resin charged in the furnace and material used; and the pounds of particulate used in the MWTE. Some of the boilers are applicable to NSPS Dc so the reporting requirements of NSPS Dc are included in the permit.

IX. Title V Review - 9 VAC 5 Chapter 80, Part II, Article 1

This source is a synthetic minor source and is not applicable to Article 1.

X. Other Considerations

During the permitting process, the facility requested to have the way the SCRAM jet emissions are tracked changed. They originally proposed to track the number of runs, however, they feel that tracking the number of pounds of heated air produced will be a better representation of how much NOx is generated from the process. The new emission factor is in now in pounds of heated air/year.

For the generators, the older generators with higher emission factors for pollutants have been limited to 36,000 gallons annually. All generators have a limit of 50,000 gallons, so the newer NSPS generators could potentially use more than the difference – 14,000 gallons – but the facility would need to reduce the usage of fuel to the

older units and keep track of the emissions from each kind (NSPS/non-NSPS) to make sure the emission limits are not exceeded.

During the draft permit review process the facility specifically requested that the distillate oil throughput limits for the Conventional Combustion Units should be combined, while the Dc boilers should be broken out from the other units for the natural gas throughput. This will allow the facility more flexibility on firing the different units using the two fuels. (See comments from facility dated August 31, 2016).

XI. Recommendations

Recommend Approval.

Attachments

Permit Writer's Signature: _____

Air Permit Manager's Signature: _____